IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

Please AMEND claims 6, 9, 12, and 18-19, in accordance with the following:

1. (Previously Presented) A coding method comprising:

using at least one processor for:

inputting audio signal and extracting audio data from said audio signal;

slicing the audio data so that sliced audio data corresponds to a plurality of layers;

obtaining scale band information defining a scale factor for each of a plurality of scale frequency bands and coding band information defining a coding model for a plurality of coding frequency bands, the scale frequency bands and coding frequency bands corresponding to each of the plurality of layers;

coding additional information containing scale factor information and coding model information based on scale band information and coding band information corresponding to a first layer;

obtaining quantized samples by quantizing audio data corresponding to the first layer with reference to the scale factor information;

Huffman-coding the obtained plurality of quantized samples in units of symbols in order from a symbol formed with most significant bits (MSB) down to a symbol formed with least significant bits (LSB) by referring to the coding model information; and

repeatedly performing the steps with increasing the ordinal number of the layer one by one every time, until coding for the plurality of layers is finished,

wherein the Huffman-coding of the plurality of the quantized samples comprises:

mapping a plurality of K quantized samples on a bit plane where K is an integer; and

coding the K quantized samples in units of K-bit sized symbols in consideration of a bit range allowed in each of the plurality of layers corresponding to the samples in order from a symbol formed with MSB bits down to a symbol formed with LSB bits by obtaining a scalar value corresponding to the symbol, and performing Huffman-coding by referring to the K-bit binary data, the obtained scalar value, and a scalar value corresponding to a symbol higher than a current symbol on the bit plane.

2. (Original) The method of claim 1, further comprising, before the coding of additional information, obtaining a bit range allowed in each of the plurality of layers, wherein in the coding of the obtained plurality of quantized samples, the number of coded bits is counted, and if the number of counted bits exceeds a bit range corresponding to the bits, coding is stopped, and if the number of counted bits is less than the bit range corresponding to the bits even after quantized samples are all coded, bits that remain not coded after coding in a lower layer is finished are coded to the extent that the bit range permits.

3. (Original) The method of claim 1, wherein the slicing of audio data comprises:

performing a wavelet transform of audio data; and

slicing the wavelet-transformed data by referring to a cut-off frequency so that the sliced data corresponds to the plurality of layers.

4-5. (Cancelled)

6. (Currently Amended) A method for decoding audio data that is coded in a layered structure, with scalability, comprising:

using at least one processor for:

inputting audio signal and extracting audio data from said audio signal;

differential-decoding additional information containing scale factor information and coding model information based on scale band information and coding band information corresponding to a first layer;

Huffman-decoding the audio data in groups of K quantized samples, each group including K-bit sized symbols in order from a first symbol formed with MSB bits, a symbol formed with MSB-1 bits, down to a symbol formed with LSB bits and obtaining quantized samples by referring to the coding model information;

inversely quantizing the obtained quantized samples by referring to the scale factor information;

inversely MDCT transforming the inversely quantized samples; and

repeatedly performing the steps with increasing the ordinal number of the layer one by one every time, until decoding for a predetermined plurality of layers is finished,

wherein the Huffman-decoding of audio data comprises:

decoding audio data in units of symbols in consideration of a bit range allowed in each of

the plurality of layers corresponding to the audio data, in order from a symbol formed with MSB bits down to a symbol formed with LSB bits; and

obtaining quantized samples from a bit plane on which decoded symbols are arranged; and

wherein in decoding audio data, a 4*K bit plane formed with decoded symbols is obtained.

7-8. (Cancelled)

9. (Currently Amended) An apparatus, including at least one processing device, for decoding audio data that is coded in a layered structure, with scalability, comprising:

an unpacking unit which differentially decodes additional information containing scale factor information and coding model information based on scale band information and coding band information corresponding to a first layer, and by referring to the coding model information, Huffman-decodes audio data in groups of K quantized samples, each group including K-bit sized symbols in order from a first symbol formed with MSB bits, a symbol formed with MSB-1 bits, down to a symbol formed with LSB bits and obtaining quantized samples;

an inverse quantization unit which inversely quantizes the obtained quantized samples by referring to the scale factor information; and

an inverse transformation unit using the at least one processing device which inverse-transforms the inversely quantized samples,

wherein the unpacking unit decodes audio data in units of symbols in consideration of a bit range allowed in each of a plurality of layers corresponding to the audio data, in order from a symbol formed with MSB bits down to a symbol formed with LSB bits, and obtains quantized samples from a bit plane on which decoded symbols are arranged; and

wherein the unpacking unit obtains a 4*K bit plane formed with decoded symbols.

10-11. (Cancelled)

12. (Currently Amended) An apparatus, including at least one processing device, for coding audio data with scalability comprising:

a transformation unit using the at least one processing device which MDCT transforms the audio data;

a quantization unit which quantizes the MDCT-transformed audio data corresponding to

each of a plurality of layers, by referring to the scale factor information, and outputs quantized samples; and

a packing unit which differential-codes additional information containing scale factor information defining a scale factor for each of a plurality of scale frequency bands and coding model information defining a coding model for a plurality of coding frequency bands, the scale frequency bands and coding frequency bands corresponding to each of the plurality of layers, and Huffman-codes the plurality of quantized samples from the quantization unit, in units of symbols in order from a symbol formed with most significant bits (MSB) down to a symbol formed with least significant bits (LSB) by referring to the coding model information,

wherein the packing unit maps a plurality of K quantized samples on a bit plane where K is an integer, codes the K quantized samples in units of K-bit sized symbols in consideration of a bit range allowed in each of the plurality of layers corresponding to the samples in order from a symbol formed with MSB bits down to a symbol formed with LSB bits by obtaining a scalar value corresponding to the symbol formed with K-bit binary data, and performs Huffman-coding by referring to the K-bit binary data, the obtained scalar value, and a scalar value corresponding to a symbol higher than a current symbol on the bit plane.

13. (Original) The apparatus of claim 12, wherein the packing unit obtains scale band information and coding band information corresponding to each of the plurality of layers, and codes additional information containing scale factor information and coding model information based on scale band information and coding band information corresponding to each layer.

14. (Original) The apparatus of claim 12, wherein the packing unit counts the number of coded bits and if the number of counted bits exceeds a bit range corresponding to the bits, stops the coding, and if the number of counted bits is less than the bit range corresponding to the bits even after quantized samples are all coded, codes bits that remain not coded after coding in a lower layer is finished, to the extent that the bit range permits.

15. (Original) The apparatus of claim 12, wherein the packing unit slices the MDCT-transformed data by referring to a cut-off frequency so that the sliced data corresponds to the plurality of layers.

16-17. (Cancelled)

18. (Currently Amended) A coding method comprising:

using at least one processor for~~;~~ inputting audio signal and extracting audio data from said audio signal;

slicing audio data so that sliced audio data corresponds to a plurality of layers;

obtaining scale band information defining a scale factor for each of a plurality of scale frequency bands and coding band information defining a coding model for a plurality of coding frequency bands, the scale frequency bands and coding frequency bands corresponding to the plurality of layers; and

differentially coding additional information containing scale factor information and coding model information based on scale band information and coding band information corresponding to a first layer;

obtaining quantized samples by quantizing audio data corresponding to the first layer with reference to the scale factor information;

Huffman coding the obtained plurality of quantized samples in units of symbols in order from a first symbol formed with most significant bits (MSB), a symbol formed with MSB-1 bits, down to a symbol formed with least significant bits (LSB) by referring to the coding model information; and

repeatedly performing the steps with increasing the ordinal number of the layers one by one every time, until coding for the plurality of layers is finished.

19. (Currently Amended) A decoding method comprising:

using at least one processor for~~:~~ inputting audio signal and extracting audio data from said audio signal;

differentially decoding additional information containing scale factor information defining a scale factor for each of a plurality of scale frequency bands and coding model information defining a coding model for a plurality of coding frequency bands, the scale frequency bands and coding frequency bands corresponding to each of plural layers;

Huffman decoding audio data in units of symbols in order from a first symbol formed with MSB bits, a symbol formed with MSB-1 bits, down to a symbol formed with LSB bits and obtaining quantized samples by referring to the coding model information;

inversely quantizing the obtained quantized samples by referring to the scale factor information;

inversely MDCT transforming the inversely quantized samples; and

repeatedly performing the steps with increasing the ordinal number of the layer one by one every time, until decoding for a predetermined plurality of the plural layers is finished.